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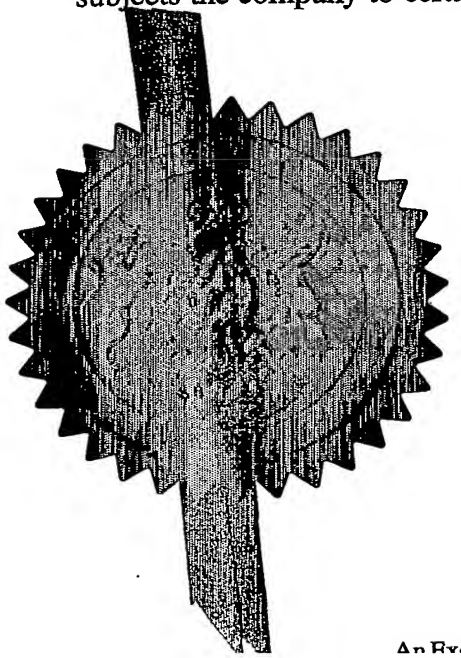

Signed Stephen Hordley

Dated 8 December 2004

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The Patent Office
Cardiff Road
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1. Your reference — P019047GB

2. Patent application number *(The Patent Office will fill in this part)* — 0327137.6 — 21 NOV 2003

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

INTELLPROP LIMITED
PO BOX 626
NATIONAL WESTMINSTER HOUSE
LE TRUCHOT ST PETER PORT
GUERNSEY

Patents ADP number *(if you know it)* 79005330001

If the applicant is a corporate body, give the country/state of its incorporation — A GUERNSEY COMPANY

4. Title of the invention — TELECOMMUNICATIONS SERVICES APPARATUS

5. Name of your agent *(if you have one)* — D Young & Co

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

21 New Fetter Lane
London
EC4A 1DA

Patents ADP number *(if you know it)* — 59006

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*
a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

Yes

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Description	14
Claim(s)	0
Abstract	0
Drawing(s)	3 only

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Priority documents	0
Translations of priority documents	0
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	2
Request for preliminary examination and search *(Patents Form 9/77)*	0
Request for substantive examination *(Patents Form 10/77)*	0
Any other documents *(please specify)*	Facsimile Letter Dated 21 November 2003

11. I/We request the grant of a patent on the basis of this application.

Signature D. Young & Co. Date 21.11.03

D Young & Co (Agents for the Applicants)

12. Name and daytime telephone number of person to contact in the United Kingdom — Adam Piloh — 023 8071 9500

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TELECOMMUNICATIONS SERVICES APPARATUS

This invention relates to a telecommunications services apparatus for use with a mobile telecommunications system, such as a mobile telephone system.

Users of mobile telephones can directly call other users of telephones, and can also have access to a wide variety of voice services, including network-based services such as voicemail and information/entertainment services such as live radio feeds, but only if they can obtain the number to dial.

Normally, users access these services by originating a call to the service delivery equipment by dialling a string of digits representing the telephone number of the service. Most people have difficulty memorising more than a few telephone numbers and therefore use various forms of directory to provide a translation from meaningful alphanumeric name to digit string.

In the case of mobile telephone users, the directory or 'phonebook' contained within the handset is most useful. However if a service is called infrequently the user may not have stored the number, either because of capacity limitations or because future use was not foreseen. Later, when the service is required, obtaining the number from other sources may be difficult, especially if the user is away from home or office.

In another branch of communications, the same problem of using long digit strings to identify Internet websites has been very effectively overcome by allowing users to enter alphanumeric addresses (domain names) of the form "www.companyname.com". Such addresses are translated within the Internet network to the required numeric strings. Furthermore, Internet search engines are available so that when a user cannot remember or does not know the required domain name, an approximation or keyword can be entered to enable intelligent identification of potentially desired websites.

It would be highly desirable if a similar scheme were available to enable access to telephone services via alphanumeric addresses.

Some attempts to overcome this problem have been made with personal numbers and particularly freephone numbers. For example, generic identifiers in the UK such as 0800 FLOWERS are used to route calls to a specific florist, or (with Intelligent Network number translation facilities) to the florist nearest to the caller. Specific identifiers, such as 0800 TELSIS, can be dialled to reach a particular company or organisation.

In such cases, the organisation 'owning' the alphanumeric address has in fact 'bought' a telephone number where the digits correspond to the letters usually printed on a telephone keypad. Thus 0800 TELSIS is actually 0800 835747. A drawback of this approach is that, because each of the digit keys represents several letters, other organisations may not be able to use the same scheme – for example 0800 VEKRIS is also 0800 835747. Thus utilisation of the significantly increased address space offered by alphanumeric addressing is severely limited. Furthermore the availability of alphanumeric names is limited in some national numbering plans to names that match the standard number length.

Other drawbacks of the '0800 TELSIS' approach include the fact that a number of different layouts for letters on telephone keypads are in use throughout the world. Whilst the situation has been eased in recent times with the introduction of an ISO standard, organisations may still have to promote both alpha and numeric telephone numbers, e.g. '0800 TELSIS (835747)'.

In addition, callers who are not in the 'home' country have difficulty in accessing such numbers. For example, somebody in the Netherlands wishing to call Telsis in the UK would normally have to dial the international access code, followed by the country code and then the UK telephone number (without the leading zero), i.e. 0044 800 TELSIS. This means that the caller would have to know where Telsis is located and the appropriate country code and number format.

Even if these are known, access is unlikely to be permitted because 0800 is a freephone code and, even where networks allow it, the organisation may not wish to accept the charges resulting from international calls.

An attempt to overcome these difficulties and restrictions has been made through introduction of the Universal Freephone service in which a logical country code of 800 has been allocated. Thus dialling 00 800 00 TELSIS could allow access to Telsis from any country supporting the Universal Freephone service, but in practice the organisation has to arrange for the particular Universal Freephone number to be activated in every country from which it is prepared to accept calls. The points made above regarding name/number clashes (TELSIS/VEKRIS) and inefficient use of the potential address space are still valid for Universal Freephone, and in addition the caller must remember the exact number format, i.e. 00 800 00 .... in this case.

As can be seen, numeric numbering schemes within the world's telecoms networks are inherently restrictive, resulting in an impaired service to users and reduced network revenues. The restrictions could be overcome with a means to easily use alphanumeric addressing.

As discussed above, it is possible to use alphanumeric representations of telephone numbers but with significant limitations.

Mobile telephones typically have a directory of 'phonebook' facilities which enable telephone numbers and appropriate alphanumeric identifiers to be stored within the handset. As discussed, these have limited capacity and a required telephone number may not be stored.

It is normally possible to store a single number which can access a service or destination from any country. For example, (unlike a call from the fixed network) +44 1489 885877 will reach the required destination whether the call is made from within the UK or overseas. However should the number change, e.g. through a national code change, then the user will have to edit the mobile handset phonebook entry.

Mobile handsets have another facility which can be used to overcome some of these limitations – the Short Message Service (SMS) forming part of the GSM standard enables alphanumeric text messages to be sent to a destination. This destination can be a system including a database which can provide information in response to a query.

For example, the SMS text 'TRAINS' could be sent – the system would reply by sending a message such as 'Train Enquiries on 08457 484950' back to the handset. In another example the SMS text 'TAXIS FAREHAM' could be sent – the mobile handset would then receive an SMS reply providing a list of taxi companies in the Fareham area, together with their phone numbers.

The mobile phone user can then call a selected number, either by keying in the number again or by using the 'Use Number' facility available in some handsets which enables extraction of numbers from SMS messages for immediate use in dialling.

A disadvantage of this approach is that it may not allow simple, straightforward use when roaming – it may be necessary for the mobile user to include the international access code and country code and to remove the leading digit of the number, for example. A situation where this might arise is with an international traveller wishing to arrange for a local taxi company to collect him from the airport when he arrives home. The standard taxi

number service would use national telephone numbers rather than international, so as not to confuse the majority of users.

Another example of the limitation of this facility is in accessing services which are normally reached by dialling a short code when connected to the home network. Such services may include voicemail, customer services, and information/entertainment services. Current limitations of mobile networks with respect to international call handling mean that, in the majority of cases, calls to a short code are not passed through the international gateway.

Furthermore, current limitations of international call handling mean that the caller's CLI is often not delivered to a destination. This can restrict access to certain services and destinations.

Prior art disclosed in EP01308098.1 shows how alphanumeric entry on the user's handset using a text message can be used to initiate call connection by outdial from an apparatus to both the caller and the destination, the destination number being derived from the text message. This is referred to as an 'outdial method'.

Further prior art disclosed in GB9917723.0 shows that alphanumeric entry on the user's handset using a text message can cause the return of a number to the user permitting the user to complete a voice call by normal dialling means. This is referred to as an 'indial method.'

However the indial method described requires to user to perform two separate steps, first to send a text message to a well-known service number, and then to make a voice call to a (different) received directory number, which is inconvenient.

Another limitation of the prior art is that text messaging in traditional networks is subject to variable delays, particularly in the transit time through an SMS Service Centre. At busy times messages can be delayed for minutes of hours. This could result in unacceptable delays for the user trying to set up a voice call, and would increase the window where an unexpected call could arrived between the sending of the text message and the outdial from the network to the user, leading to possible confusion.

Prior art disclosed in GB0310951.9 discloses alpha name servers used to provide the translation between alpha strings and network addresses in much the same way as Domain Name Servers provide IP addresses from Internet URLs.

According to the invention there is provided a telecommunications services apparatus for use with a mobile radio telecommunications system, said apparatus comprising:

a text message decoder for receiving and acknowledging a text message addressed to a service number from a mobile station of the mobile radio telecommunications system, and for identifying the received text message as a request for call connection to a telephone number associated with the received text message; and a call connection means for receiving, subsequent to said text acknowledgement, a voice call addressed to the same service number and outdialling to said telephone number associated with the received text message and connecting the outdialled call to said received call from mobile station.

According to the present invention the said apparatus retains memory of the number translation last used so that further calls, reconnections, replies or text messages may be made to the same destination without re-entry of the alphanumeric name.

Preferably the destination is announced to the caller before connection.

Preferably the said text message is delivered to the apparatus using direct delivery means, bypassing possible SMSC delays. This removes temporal ambiguity from the call set-up process and provides predictable call set-up performance.

According to the invention, said call connection means also sends an identification signal characteristic of the telephone number of said mobile station to said telephone number associated with the received text message.

Preferably the first acknowledgement of the text message delivery received at the handset is indicative that the apparatus has received and processed the message and is ready to accept a voice call and connect it to a telephone number associated with the received text message.

According to the invention there is further provided a telecommunications services apparatus for use with a mobile radio telecommunications system, said apparatus comprising:

a text message decoder for receiving a text message addressed to a service number from a mobile station of the mobile radio telecommunications system, and for identifying the received text message as a request for call connection to a telephone number associated with the received text message; and a call connection means for outdialling, subsequent to receiving said text message, a voice call addressed to the said telephone number associated with the received text message and to the mobile station that initiated the text message, a connecting the two calls together.

According to the invention, said call connection means is also operable subsequent to a drop in the connection to accept a voice call addressed to the said service number as a request to reconnect the previously connected parties.

Optionally the apparatus could be arranged to commence outdial to the telephone number associated with the received text message before returning the text message acknowledgement and in the event that the call proceeds to alerting a positive acknowledgement is sent while in the case of a call failure e.g. busy or NU then a negative acknowledgement is sent.

Preferably the CLI of an outdialled call to the originator of the text message is the same as the service number to which the text message is sent, allowing the user to easily recognise the call as being the one initiated by the text message, rather than a different call.

Preferably, the text message decoder includes a database linking text identifiers with respective telephone numbers. Means may be provided for accessing at least one external database linking further text identifiers with respective further telephone numbers. The call connection means may be operable to connect the calling mobile station to the respective voice mailbox provided by the system.

The invention will now be described by way of example with reference to the accompanying drawings, throughout which like parts are referred to by like references, and in which:

Figure 1 is a block diagram of a telecommunications services apparatus in accordance with an embodiment of the invention, comprising an alpha dialling system;

Figure 2 is a block diagram showing a network configuration of the dialling system; and

Figure 3 is a diagram showing a possible database structure.

Referring to Figure 1, there is shown a dialling system comprising a call connection system CCS and an alpha dialling decoder and database ADDD. The call connection system provides communication with a mobile station (caller) MS, and with a destination/service.

In a preferred embodiment, the mobile user compiles an SMS text message which comprises an identifier for the required destination party, service or category of services. The message is sent via the normal mobile telephone network to the ADDD. This system performs a database look-up to obtain a telephone number which corresponds to the text identifier. In the case of a category of services, sponsored numbers may be provided as the preferred translations, allowing the directory system to provide a commercial income. For example, if the text message comprises 'PLUMBER', then the directory may be operable to lookup the number of, for example—

- The nearest plumber, using well-established location based mechanisms
- One of a list of plumbers in the local area
- One of a list of plumbers who have subscribed to a premium service whereby their numbers are preferentially provided

Preferably the system provides an audio announcement to one or both ends, to indicate to the caller exactly who has been reached, and to the recipient to indicate or advertise the connecting service.

The ADDD sends this number (which represents the destination), together with the Calling Line Identity of the mobile station that sent the SMS text, to the CCS. The CCS dials out to the mobile (which may be anywhere in the world where there is a roaming arrangement with its home network) and, once connected, dials out to the destination number. The

order of dialling may alternatively be reversed or simultaneous, preferably with audio prompts to inform at least the first answering party that a call is being connected to them. The two call legs are connected together within the CCS so that the mobile user is connected to the required destination or service. To ensure that the called party or system is aware of who's calling, the CCS may establish the outdialled call to the destination or service with the CLI (Calling Line Identity) of the caller.

In this way, the user merely has to enter an identifier for the required service and send it by SMS to the dialling system, the access number for which may be a memorable short code or even a single number stored within the mobile stations phonebook. Everything else involved in connecting the caller to the required service is fully automatic.

It is anticipated that the dialling system is located in the user's home network as this would readily enable connection to services normally accessed by short codes within the home network.

It is envisaged that the system described would be most useful on a mobile telephone network, where the facilities for text and voice operations are well integrated. However it would also be possible to implement the invention on a fixed or hybrid network, for example using ISDN, which provides a convenient signalling channel that may be used to initiate the call.

Reconnection of the two parties following a dropped call, as happens occasionally with mobile calls, can be automated if the network is able to distinguish between an intentional call clear and a network failure. Fixed networks have a 'B-party Clear down' delay that allows a B-party to suspend and re-answer a call. Where the invention is used with a call terminated on a fixed network this mechanism may be integrated into the reconnection strategy in the event that the mobile call leg drops. Even if the system has outdialled to the user, the user may reconnect to the other party simply by dialling the short code, e.g. 222.

A key advantage of the present invention is that it allows a user to initiate a call to an organisation, brand, service, chat room, bulletin board etc. by simply using the name and a well-known service number, which may preferably be a short code such as 222. The

invention works identically even while the user is roaming, provided the outdial method is used, without any need for Camel support or special USSD applications. This invention is to voice telephony as the Browser is to the Internet. It opens up connectivity between users to a vast range of organisations and audio sources, without requiring the advertising or distribution or any numbers.

The invention may be used with multiple directories. For example different service codes could be used to specify—

- The user's personal directory
- A local directory
- A national directory
- An international directory
- A chat service
- A bulletin board service

For example, by sending the text MAN U to the national directory service number '222' a call is connected to the headquarters of Manchester United football club, while if the same text is sent to '900' representing the service number for a bulletin board service, then the user is connected to a voice bulletin board on the topic of MAN U.

In the case of a personal directory, the user could be permitted to specify their own short text strings and associated number translations. The directories could be searched in a precedence order, so that for example of the entered text was not matched in the local directory then the search would be expanded to the national directory.

For the first time, a user is now able to use text to enter for example 'Kit-Kat' and be connected using a voice call to a well known chocolate manufacturer. Alpha dialling for the voice network is now a reality.

Local content may be specified in the text message. For example if the user sends the text 'SAINSBURYS' to 222, he may be connected to whatever number Sainburys supermarkets choose to put in the national Name Server directory. However, if the user sends the text

'SAINSBURYS ANDOVER' to 222, he may be connected to the local store of his choice in Andover.

In a further embodiment of the invention, the user is also able to send a text message to the service number instead of making a voice call. To achieve this, a syntactic rule could be applied to the text message content. For example a message containing a '.' could suppress the voice call element and instead transmit the remainder of the message as text to the specified destination as shown below—

- Text 'British Airways' sent to 222 results in a voice call being set up to the airline.
- Text 'British Airways.Arrival time of BA567' results in 'Arrival time of BA567' being sent by text messaging means to British Airways, and no voice call being set up. When British Airways replies, it comes from CLI 222. The network retains the association between 222 and British Airways, so that if the user replies to the text message, or makes a voice call to 222, he is automatically connected with the airline.

Alternatively, to prevent confusion between delimiters such as '.' described above and other usages of the same characters in further text messages sent to 222, it would be possible for replies to come from a different CLI such as 111. Then texting or replying to 111 would unambiguously send a text message to the destination last specified using 222. Other short codes and delimiters may be used.

Delimiters may be avoided altogether if one short code is used as the destination number for the text message used to specify the alphanumeric address and a different short code is used as the destination for text messages to be sent to that address or as the destination for requesting an outdialled call set-up.

In a further embodiment of the invention, the Man Machine Interface (MMI) of the mobile telephone is modified to further simplify the process of setting up a voice call using the invention. For example the user is able to simply enter alpha text and press send. Currently on most mobile handsets one is able to enter numbers directly and then press send to make a telephone call. It is envisaged that in future alpha entry will be the norm and numeric entry will be secondary, while at present it is the other way round. Instead of using the

integrated phone book and searching for 'Mum', selecting the entry and then pressing 'Call', or entering a long number and pressing 'Call', in future the phone will display letters by default when I press keys, so that using predictive text techniques that are common today in text messaging applications, I can press three keys representing 'Mum' and then press send. This will search my personal phone book first, which may be local to the handset or network based, and then the network based directories. Transmission of the text 'Mum' to the network could be by text message or USSD means for example. When the first match is found, the call is completed to the translated number. This provides true alpha dialling capability for the mobile user.

In a further embodiment, Freephone dialling can be supported. By sending a text message containing the name of the desired organisation to a short code representing a Freephone directory (e.g. 8, 800, 1800 etc.) I can set up a free call to any organisation that has an entry in the directory. Freetext is similarly simple, using the mechanism described above. Blacklists could be supported so that any users that abused the Freephone or freetext facilities could be readily prevented from reusing the service.

Further examples of usage of the dialling system may include:

RADIO4	–	connects to a live feed of BBC Radio 4
CRICKET	–	connects to a service providing latest cricket scores
VM (or VOICEMAIL)	–	Connects to the user's voicemail system, which may be particularly useful overseas when a short access code is not available
CS (or CUSTOMER SERVICE or HELP)	–	connects to the home network operator's customer service centre
RAC	–	connects to a motoring organisation

TELSIS	–	connects to organisation
BOSCH DISHWASHER	–	connects to appropriate help desk within company for specified product support
HOME	–	connects to the user's home (with the benefit that CLI is passed on)

Use of the dialling system may be charged for in a number of ways. In normal circumstances the caller would pay for the SMS text transmission. The network operator may wish to charge for both call legs (i.e. back to the mobile and onward to destination) or only one call leg depending upon the type of service accessed. Furthermore, the call may be charged to the mobile user or to the destination, or to a combination. All of the information required for billing is provided by the CCS including the CLI of the caller.

The database within the ADDD may contact multiple entries for the same service. For example,

RADIO4
RADIO 4
R4
BBC RADIO4
BBC RADIO 4
BBC R4

may all point to the same service, and the ADDD may also incorporate intelligent text analysis so that other forms of the same request could be understood.

The system may generate service usage statistics such as information regarding the number of calls to particular services and the text identifiers used to access them. In addition, the system can report all text identifiers for which there is no entry in the database. This will enable the network operator or service provider to determine whether alternative text identifiers need to be added to the database to enable access to existing services, or whether there is a demand for additional services.

In addition, it is anticipated that the dialling system may support 'intelligent interaction' to assist the user gaining access to services. For example, the user may send the identifier 'RADIO FOUR', which may not be in the database. In-built intelligence would determine that the 'FOUR' could be represented by '4' and the system would send an SMS message back to the user with contents of the form

RADIO FOUR is not recognised. Do you require RADIO 4 ?
If so, just reply to this message without changing the contents.

The re-transmitted message would be identified and the user connected to the appropriate service just as if they had sent 'RADIO 4'.

These facilities enable maximisation of service availability and system usage, with consequent customer satisfaction and revenue generation.

System usage can also be monitored on an individual user basis, and this may enable the system to build up preference lists so that personal services can be offered.

Indeed, it is envisaged that the system supports personalisation at the network level (for example, UK BT Cellnet customers may have their VM or VOICEMAIL entry translated to 901 or 902 depending upon whether they use standard voicemail or 'voicemail plus').

In addition, the user is able to set up their own personal database entries, such as HOME. This enables users to take advantage of the system's ability to deliver CLI even when the user is roaming on a foreign network – overcoming the problem of not being able to call home (or other destinations) because calls are either automatically or manually rejected because no CLI is presented.

Alphanumeric identifiers and the telephone numbers to which they translate may be held either in the ADS database or in an external system or database. Typically, when an SMS message is received with an identifier, the user's 'personal' database entries are searched first and if no match is obtained the 'network' database is checked.

Typically, the user submits personalised database entries to the system using SMS, but a variety of other methods are possible, including

- manually, via a customer services agent
- via a web interface
- via WAP (Wireless Application Protocol) messaging
- via email
- via an interactive voice service

Figure 2 shows a mobile station MS(1) communicating with a network comprising a base transceiver station BTS (2), a mobile switching centre MSC (3) and a short message service centre SMS-C (4). The network communicates via the Mobile Application Protocol MAP with a dialling system (9) embodying the invention. The dialling system (9) includes a transaction converter (5), an alpha dialling controller (6), a database (7) and a switch block (8). The switch block (8) provides communication to a selected external telephone (10) or service. The controller (6) may be connected to external systems and/or databases, as shown.

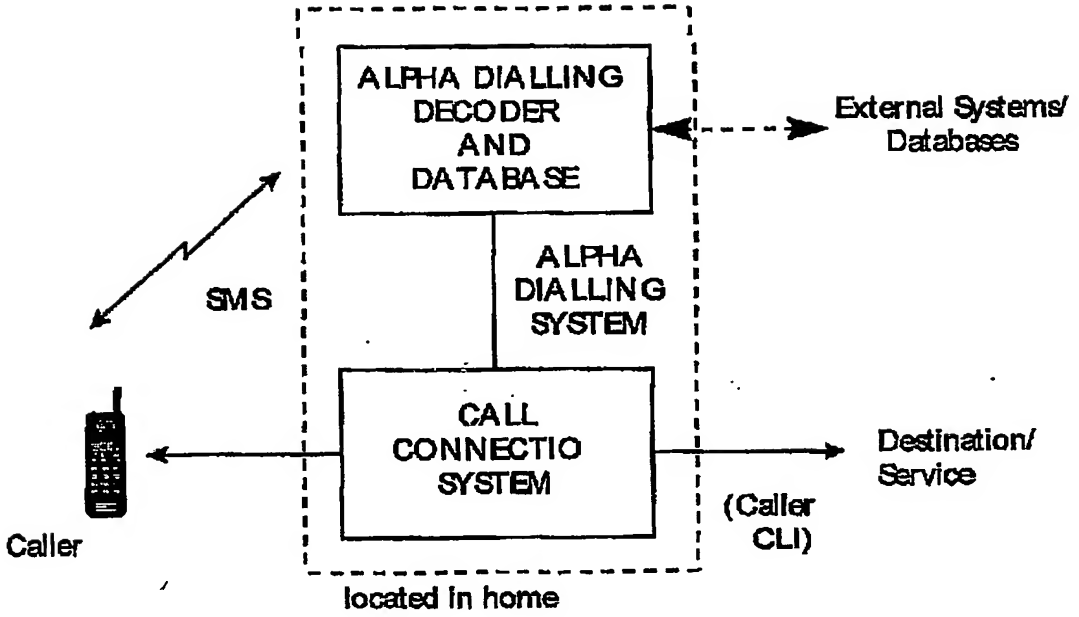

Figure 1. Alpha Dialling

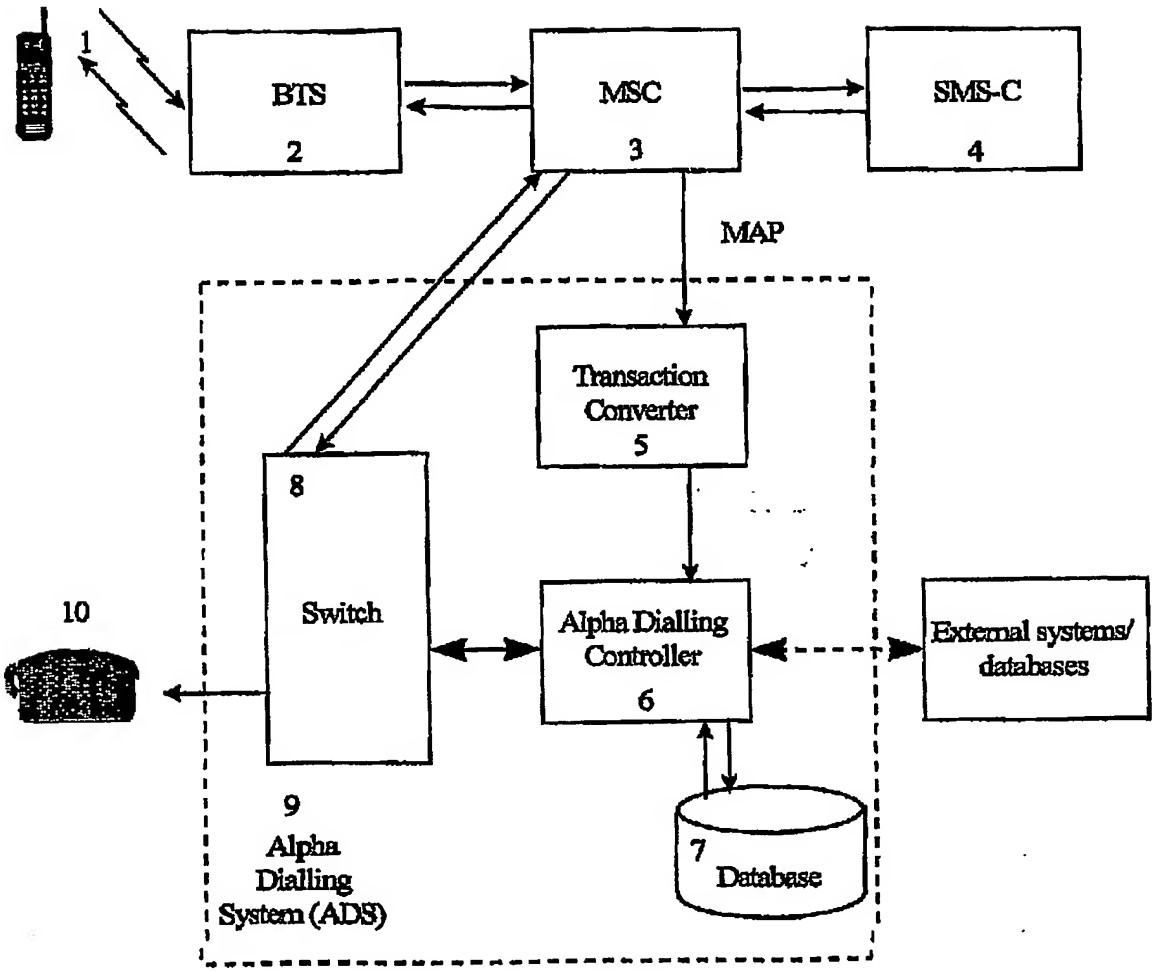

Figure 2 - System Diagram

BTS	Base Transceiver Station
MSC	Mobile Switching Centre
SMS-C	Short Message Service Centre
MAP	Mobile Application Part

Key word	Phone No.	Billing Category
CRICKET	+441111222333	1 (Caller pays)
•••		
RADIO4	+442211334455	1 (Caller pays)
•••		
COMPANYNAME	+442222112233	2 (Called party pays)
•••		

Figure 3 - Database Structure